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Industrial Schools

[Recommendations and Regulations for Evening Industrial Schools

Recommendations for the Establishment and Organization of General, Special, and Co-operative Industrial Schools

September, 1911

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INDUSTRIAL SCHOOLS

I. INTRODUCTORY

Definitions of Names

In *The Industrial Education Act* and the Regulations of the Department of Education, the name Industrial is applied to schools and classes for the preparation of workmen and workwomen; and the name, Technical, to those for the preparation of foremen and forewomen and the holders of minor directive positions in the trades. Manual Training and Household Science, hitherto designated Technical, are now classed as cultural and practical subjects of the High and Public School courses of study, and still remain wholly under the control of the School Boards. While introductory to Industrial and Technical courses, they are, however, neither Industrial nor Technical themselves. The foregoing distinctions should be borne in mind.

Classes of Industrial, Technical, and Art Schools

At the last session of the Legislature, *The Industrial Education Act* replaced all the preceding Acts which dealt with elementary Industrial, Technical and Art education; and this Act, it is important to remember, is the only one under which Industrial, Technical, and Art Schools can now be established and maintained at the public expense. Section 4 of the Act provides for the following classes of schools, which a High School Board or a Board of Education of any city, town, or village, or an Urban Continuation School Board may establish with the Minister's approval:

(1) General Industrial Schools for instruction in such subjects as may form a basal preparation for the trades, including work-shop practice, with correlated drawing, English, and practical mathematics and science, and continuing the essential subjects of good general education.

(2) Special Industrial Schools, providing for instruction in the theoretical and practical work of particular trades carried on in the city, town, or village, and when deemed desirable in the essential subjects of a good general education.

(3) Technical High Schools and departments of High Schools for the training of duly admitted High School pupils for minor directive positions in industrial establishments.

(4) Co-operative Industrial Schools in which and under such conditions as may be agreed upon between the Board and the employer: (*a*) apprentices, whether articled or not, employed in the workshops may receive in the day schools instruction bearing upon their trades; and (*b*) pupils attending the day schools may receive practical instruction in the workshops.

(5) Schools for instruction in the Fine and Applied Arts.

(6) Industrial, Technical, and Art Evening Schools, in which workmen and workwomen employed during the day may receive theoretical and practical instruction in their trades.

Ministry of Education, Ontario
Historical Collection

Advisory Industrial Committee

Under this Act also the control and management of these schools are vested in an Advisory Industrial Committee, composed of twelve members; six members of the Board, and six others, not members of the Board, three of whom are employers and three employees, in connection with the manufacturing and other industries carried on in the locality. It is reasonably assumed that these representatives have an expert knowledge of industrial conditions. The powers of the committee are, however, exercised, subject, in all cases, to the approval of the Board, and, in certain cases, to the joint approval of the Board and the Minister.

Admission Qualifications

Section 5 of the Act provides also that, subject to the Regulations and with the approval of the Advisory Industrial Committee, pupils may be admitted to a Special or a General or a Co-operative Industrial School by the Principal thereof from the Fourth Form of the Public or the Separate School, upon the recommendation of the Principal of such school.

In the case, however, of the Industrial, Technical, and Art Evening Schools, no educational qualification is prescribed for admission. Subject to the approval of the Advisory Committee, the only requirement is that the students shall be workmen or workwomen employed during the day.

II. EVENING INDUSTRIAL SCHOOLS

Maintenance

For some years the Legislature has made special grants to a few of the High Schools for the promotion of Industrial and Technical education, and, under the Manual Training and Household Science Regulations, a sum has been distributed annually amongst a few High Schools which are "specially organized and equipped for giving instructions in the theory and practice of the Mechanical and Industrial Arts and Sciences." At its recent session the Legislature took another step in advance; it voted $20,000 for Evening Industrial Classes. The rest of the cost of the Evening Industrial Schools shall under Section 11 of the Act be defrayed as in the case of the High Schools. Further on in the present circular will be found the Regulations approved by the Minister for the establishment and organization of such evening classes and for the apportionment of the Legislative grant therefor. These regulations come into force in the school session of 1911-1912, and Boards intending to establish Evening Industrial Schools should do so without delay, the first step being the appointment of an Advisory Industrial Committee.

Obstacles to Establishment

In establishing these evening schools three main obstacles will be encountered at the outset:

(1) Indifference on the part of those for whose benefit they are intended;

(2) The lack of competent teachers; and

(3) The difficulty of constructing courses of study suitable to the requirements of the locality.

As to (1) : Notwithstanding the constitution of the Advisory Committee it is important that a canvass be made of the local industrial situation. The Advisory Committee should, accordingly, confer with other employers and employees before attempting to organize the school. The sympathetic co-operation of all ranks of labour is essential to success, but on the employer in particular rests the chief responsibility. In other countries, where a compulsory attendance law is not in operation, he offers his employees inducements of various kinds to attend—a reduction, for example, of the hours of day labour, and, especially, increased wages and more rapid promotion. Almost certainly, a similar course will be found necessary in many parts of Ontario.

As to (2) : Without competent teachers it would be folly to try to establish industrial schools of any grade. Each teacher must possess an expert knowledge of his subject, and, manifestly, the preference should be given to those who, being otherwise qualified, are now engaged, or have been engaged, in the form of industry in which they are to give instruction. For the academic subjects, if any are taken up, the day teacher will suit, provided his hours are duly limited and he has duly familiarized himself with industrial requirements; but, for the purely industrial subjects, foremen or forewomen or others specially trained for the purpose at industrial or technical colleges are indispensable. Not only will such teachers give, as, indeed, only they can give, the necessary practical turn to the work, but they will command the confidence and sympathy of the students, who recognize their efficiency in the shops. In this connection two points deserve careful consideration:

(*a*) If competent teachers cannot be obtained in the locality, they might be obtained in the vicinity. The advantage will far outweigh the extra cost of the travelling expenses.

(*b*) While the Advisory Committee will take a general oversight of the classes, it is important that they should be under the charge of a Principal who possesses both executive ability and general mechanical knowledge. Such Principal should have full control of the school, subject to the Advisory Committee.

As to (3) : The needs of the different localities vary so much that any settlement of the details of the courses must be made by the local authorities. After the subjects to be taken up have been selected, the next step in the organization should be the submission of a report upon the details, equipment, etc., by the Principal, followed by due consideration by the Advisory Committee and the Board, before submission to the Minister for his approval. The settlement of these details will be a difficult task. The first year must, however, be more or less one of experiment, and the courses should be modified from time to time in accordance with the experience of those concerned.

III. DAY INDUSTRIAL SCHOOLS

Maintenance

Outside of the special grants to a few High Schools, referred to above, and intended for Industrial Education, the Legislature has so far made no appropriations for the establishment and maintenance of the other Industrial Schools and the Technical and Art Schools provided for in the section of the Act quoted above. Possibly, however, in anticipation of further legislative action, some Advisory Committees may decide to establish Day Industrial Schools. Of schools so established, Section 11 of the Act provides that the cost of establishment and maintenance shall be defrayed as in the case of the High Schools.

Admission Qualifications

Investigation of the conditions in Ontario have shown conclusively that at present extremely few of our future workmen and workwomen have ever attended a High School. Most enter the trades from Form IV of the Public Schools, having only partly completed the course; and some, indeed, enter from Form III, having reached fourteen, the age of exemption. It is, however, fair to assume that many of such pupils would attend longer if courses were provided leading to the trades, and, especially, courses leading to more lucrative employment than they have hitherto been able to secure. In order, indeed, that the nature of the provision may be understood by the pupils themselves, it would be well for the Public and Separate School Boards to authorize the Principal of the Industrial School to bring the subject before the Fourth Forms of the locality. Moreover, care should be taken that none are admitted to the General Industrial School except those who intend to enter an industrial occupation.

If properly organized, the General Industrial School, which, as set forth in the Act, provides a preparation for the trades, and is, accordingly, in some countries, called a "Preparatory Trade School," will meet the requirements of such pupils. The only departmental test for admission to these schools hereby now imposed by the Department, in addition to that specified in the Act, is that the pupils shall have a fair knowledge of the essential subjects of the first year of Form IV of the Public School course, and that their muscles shall be strong enough to handle the lighter tools and the household utensils, and their minds developed enough to acquire skill in using them.

Courses of Study

Probably for the first year the General Industrial School will, accordingly, parallel the senior division of Form IV of the Public Schools, where, however, the courses are purely cultural. For obvious reasons, the Act leaves the initiatory steps in the determination of the courses of study to the Advisory Committee. With the assistance of competent teachers and with its knowledge of the local requirements and capabilities, the Com-

mittee should be able to prepare a suitable scheme. In order to assist in this work, suggestive courses in outline will be found further on in this circular. For additional suggestions in constructing not only the courses for the General Industrial Schools, but for the other classes recognized by *The Industrial Education Act,* all concerned should refer to the various systems and courses of study which for this purpose have been included in the Superintendent's recent *Report on Education for Industrial Purposes.*

One matter it is important to bear in mind in the construction of these courses: While they are largely vocational, they should also include some of the cultural work of the Public Schools in Literature, History, Geography, and Composition in particular. This Province needs well trained workmen and workwomen, but it needs also well trained citizens.

The General Industrial Course for boys given below should extend over two years. It may, however, extend over less time if local conditions so demand, but the longer period is greatly to be desired. Moreover, if properly conducted, this General course should have developed an interest in industrial subjects, and should, on its completion, enable the student to select, with the assistance of the teacher, the industry for which he is best suited. By means either of Special Industrial Schools, or, preferably because more economically, of Co-operation between the school and the local apprenticeship systems, the boy's industrial education might be continued for a couple of years longer—to a stage where what he needs to become an expert workman is chiefly longer practice and experience. Where at all possible, Boards should establish a four years' course for boys—two of the General Industrial School and two of the Special, or of the Co-operative School. The establishment of the General Industrial School would attract and retain the student from thirteen or fourteen till sixteen, the period when his growing power is greatest and his earning power is least; but only a four years' course can produce the mental and physical training needed for a life of progression in industrial efficiency. Owing to the less exacting nature of their trades, probably a year or so of a General Industrial course, followed by one or two years of a Special Industrial course, will be found to be sufficient for girls, especially where Household Science forms part of their Public School course. Owing also to the practical character of much of the school work and the future claims upon the students, the school day might reasonably be extended to six or even six and a half hours. See the Superintendent's *Report on Education for Industrial Purposes,* pp. 191-192, 222-238, 282-296, and 337-341.

As soon as an industrial course is comprehensive enough, the Minister will be prepared to co-operate with the local authorities in holding examinations and awarding diplomas.

Qualifications of Staffs

Reference has already been made to the difficulty of securing teachers for the Evening Industrial Schools. Still more difficulty will be experienced in securing teachers for the General Industrial Schools. To maintain the necessary correlation amongst the subjects, the teacher, when

there is only one, should be conversant with the whole course, and where there are more than one, each should possess this qualification; for although in the organization he may be called upon to teach only one part, to do it well he must know the whole. Few such teachers are as yet available in Ontario; but, as soon as practicable, courses of instruction will be provided by the Department. After having spent most of the present school year in Europe and the United States preparing for his new duties, Inspector Merchant, who has been appointed Director of Technical and Industrial Education, will, after next midsummer, visit the industrial centres of the Province and assist School Boards in organizing their local systems.

IV. REGULATIONS

FOR

EVENING INDUSTRIAL SCHOOLS

Conditions of Establishment

1. No Industrial Evening School shall be recognized by the Department of Education which has not a total enrolment for each of (1) men and boys and (2) women and girls, of at least ten members in regular attendance from the beginning to the end of each term.

2. At dates to be selected by the Advisory Industrial Committee, the Session shall begin in the last week of September and shall close in the last week of April.

Note.—If found necessary, a Board may defer the opening of this session until the end of the first week in October.

3. The Session shall consist of two terms, the first ending the last week in December and the second the last week in April.

4. The School shall be open for at least two hours on each of at least two evenings a week.

5. As provided in 4 (6) of the Act, quoted above, the members of the classes shall consist of workmen and workwomen who are employed during the day.

6. (1) Each teacher shall possess expert knowledge of his subject. In the appointment of such experts, the preference shall be given to those who, being otherwise qualified, are now engaged or have been engaged in the form of industry which they are to teach.

(2) When day teachers are employed also in the Evening Industrial Schools, their work shall be so arranged that no teacher shall teach more than six hours a day.

7. The organization, qualifications of the staff, accommodations, equipment, courses of study, and text-books shall be subject to the Minister's approval.

8. (1) As far as it may be suitable, the equipment already provided for the Science, Manual Training, and Household Science courses of the High and Public Schools and the Day Industrial and Technical Schools shall be used for the Evening Industrial Schools.

(2) Where no, or insufficient, equipment has been provided which is suitable for Evening Industrial Schools, the Boards shall provide from year to year such equipment for these schools as the Minister may deem necessary. The equipment thus provided shall, when needed, be used for Day Industrial Schools also.

Courses of Study

9. All the subjects of the courses shall be so taught as to have a direct application to the industries.

10. From the lists below, the Advisory Industrial Committee shall make such selection as, in its judgment, suits the requirements and capabilities of the locality; but in addition to these subjects, any other subject or subjects which have a direct application to any of the industries may be taken up with the Minister's approval.

11. From the following lists for boys and men and for girls and women respectively, each student shall take up at least one of the subjects in A, and may take up in addition one or more of the subjects in B. The total number to be taken up by each student shall, in each case, be determined by the Principal.

12. In localities where there are Evening Commercial Classes under the same Board, business English, business arithmetic, and commercial work shall not be included in the courses for Evening Industrial Classes; but it shall be the duty of the Advisory Commercial Committee, acting in concert with the Advisory Industrial Committee, to provide courses in these subjects suitable for workmen and workwomen engaged in the industries.

I. *List of Subjects for Boys and Men*

A. Freehand drawing, mechanical drawing, architectural drawing, design, modelling; wood working, metal working, electrical working, building construction, printing, plumbing, physics, chemistry, mechanics.

B. Workshop mathematics, estimating, business English, commercial work, first aid.

II. *List of Subjects for Girls and Women*

A. Cookery, home economics, first aid, home nursing; hand sewing, machine sewing, dress making, millinery, embroidery, laundry work; freehand drawing, design, colour harmony.

B. Business arithmetic, business English, commercial work.

Apportionment of the Legislative Grant

1. *On Salaries*

13. The Department of Education will pay the following proportion of the total salaries of the staffs of the Industrial Evening Schools:

In cities with populations of 150,000 and over, one-third; in other cities, one-half; in towns, two-thirds; and in villages, five-sixths.

2. *Equipment*

14. Where no, or insufficient, equipment is available, the Department will pay for each of the first four years 25 per cent. of the cost of equipment approved by the Minister, up to a maximum of $1,000 in the case of the classes for boys and men, and $500 in the case of the classes for girls and women. Thereafter, the Department will allow 25 per cent. of the cost of renewals and additions approved by the Minister, not exceeding, in any one year, $300 in the case of the schools for boys and men, and $150 in the case of the schools for girls and women.

Accounts

15. The receipts and expenditures on account of the Evening Industrial Schools shall be kept separate from those for other school purposes.

V. COURSES FOR DAY INDUSTRIAL SCHOOLS

I. General Industrial Schools for Boys

English.—*Grammar*: The elements, with emphasis on the practical applications.

Composition: Oral and written; reports and descriptions; business and friendly letters.

Spelling: Words in general use; emphasis on words used in men's trades.

Reading: Intelligent and intelligible reading: The Fourth Book and the High School Reader; exercises in articulation and vocalization.

Literature: A course of reading in school and at home of standard authors.

Note.—The course in Grammar should be that of Form IV and the Junior Grade of Form V of the Public Schools. The course in Composition should train to accurate, plain, and forcible expression, and should deal mainly with industrial topics. Suitable industrial magazines should be supplied. The course in Literature should cultivate a taste for good reading.

Mathematics.—*Arithmetic*: Vulgar fractions and their decimal equivalents; the common and the metric system; percentage and its practical applications; approximate and check methods; four figure logarithms applied to multiplication and division; power roots and pocket-book formulas; oral arithmetic.

Mensuration: Measurement and calculation of areas of plane figures and of volumes by workmen's methods.

Algebra: Elementary processes; simple workshop formulas; solutions of simple equations; plotting of points and simple graphs.

Note.—Only the essentials of Algebra should be taken up, and they should deal with formulas used in workshop practice.

Geometry: Use of instruments; simple construction leading to the self-checking of the students' work; measurement of angles and their ratios by construction and by comparison with trigonometrical tables; the geometry of simple solid figures, etc.

Note.—The course in Mathematics should deal throughout with such calculations as weights of castings, measurement of areas, calculation and use of the measuring tools used in the trades, calculations by graphic methods, etc. Free use should be made of mechanics' and engineers' handbooks for formulas and tables.

Science.—*Physics*: Measurement; elementary mechanics of solids and fluids; the general properties of matter.

Effects of heat on substances used for constructional purposes; specific, sensible, and latent heat, and the practical application of their qualities; melting and boiling points; steam raising and the properties of steam; the transmission of heat: conduction, convection and radiation, and their applications to practical work: hot and cold water supply; use of exhaust steam; heating and modes of ventilating.

Applications of electricity and magnetism: batteries, electromagnets, dynamos, motors, telephones, etc., electric wiring and simple testing, etc.

Chemistry: Effects of heat, moist air, water, and common acids on materials used for constructional purposes; rusting, rotting, and the use of protective coverings on metal and wood; combustion of solids, and liquid and gaseous fuels, and their application to industrial purposes.

NOTE.—The course in Science should be a practical one, with direct reference to the industries, being accompanied in each subject by the necessary theory, demonstrated experimentally.

GEOGRAPHY.—The Public School Course for Form IV and the Junior Grade of Form V, with special reference to the commercial relations of Canada.

NOTE.—In dealing with this subject the instruction should, as far as possible, centre around collections of raw materials and pictures describing the processes of manufacturing various articles. Such collections are obtainable from various school supply companies. Probably some manufacturers will donate specimens of their products in their different stages.

HISTORY AND CIVICS.—British and Canadian History, with special emphasis on the industrial development of Great Britain and Canada, inventions, discoveries, and their results; organizations and values of Trades Unions, Manufacturers' Associations, Boards of Trade, Farmers' Institutes, etc.; forms of civic government in Canada, Ontario, and Great Britain; the rights and duties of citizenship.

NOTE.—The main object of the course should be the development of the industrial citizen, and, consequently, the emphasis should be placed upon industrial or economic phenomena—upon the development of transportation and communication, the growth of municipalities, and civic organization. This involves the changes being produced by the concentration of labour and capital in production.

MATERIALS: The growth, character, and uses of various woods; the methods of preparation and manufacture of other natural products useful to man, as, for example, cotton, linen, and wool; the various kinds of coal, oil, clay, building stone, concrete, mortar, and cement; metals used in the industries: methods of tempering and preserving steel; the composition and uses of brass, Babbitt metal, pewter, etc.

DRAWING.—*Freehand*: Familiar objects in outline; simple fore-shortened faces; quick sketches to give practice in judging proportions, elementary principles of perspective practically developed; fore-shortened cylindrical and prismatic forms in outline with practical application to simple parts of machines, frames, doors, etc.

Mechanical Drawing: Principles of constructive drawing, freehand working sketches, lettering, dimensioning, making and reading of blue prints; use of instruments; scale drawing; perspective drawings developed from plans; drawings of simple pieces of machinery.

Industrial Design: An elementary course applicable to the workshop practice.

NOTE.—The course in Drawing should emphasize the accurate reading of working drawings and blue prints, and the making of sketches of parts of machines accurately and quickly. Drawing is fundamental in the industries and should be apportioned at least four or five periods a week.

COMMERCIAL COURSE.—*Arithmetic*: A short course in the application of percentage to interest, bills of exchange, discount, etc., as used in connection with the industries.

Book-keeping, Business Forms, and Penmanship: Enough single entry to enable the student to keep records of petty cash or stock-room accounts in a shop; cheques, notes, drafts, etc.; the formation of legible, quick handwriting.

NOTE.—When the course is continued long enough, the student should be trained to carry out any cost system he may find in the shop where he may be employed.

PHYSICAL CULTURE AND PHYSIOLOGY AND HYGIENE: A good system of physical exercises to develop the whole body; so much Physiology and Hygiene as will enable the workman to care for his health; first aid.

WORKSHOP PRACTICE: Elementary woodworking (reviewed, if already taken in the public schools); reading of working drawings; the usual simple exercises in joinery; exercises on the lathe; pattern-making and cabinet-making involving the use of the lathe; exercises in metal turning and in chipping and filing; forging; care and sharpening of tools; shop economics; simple specifications.

NOTE 1.—The Workshop Practice differs from the Public School Manual Training in having a definite industrial outlook, and, accordingly, in requiring a larger apportionment of time. An hour and a half or two hours is the time usually given to Manual Training; the Workshop Practice needs from three to five half days a week, according to the subject and the stage.

NOTE 2.—Visits of inspection should be paid to the factories in the vicinity. These visits should be made the subject of class discussions and compositions.

NOTE 3.—As Wood and Metal Working afford the best general training in the use of tools, courses in these subjects are given above. Where, however, the local industries are of a markedly different character, specialization therefor might be introduced after the student has had a preliminary general course in woodworking.

II. General and Special Industrial Schools for Girls

English.—*Grammar*: The elements, with emphasis on the practical applications.

Composition: Oral and written; reports and descriptions; business and friendly letters.

Spelling: Words in general use; emphasis on words used in women's trades.

Literature: A course of reading in school and at home of standard authors.

Note.—The course in Grammar should be that of Form IV and the Junior Grade of Form V of the Public Schools. The course in Composition should train to accurate, plain, and forcible expression, and should deal mainly with industrial topics. The course in Literature should cultivate a taste for good reading.

Mathematics.—*Arithmetic*: Vulgar fractions and their decimal equivalents; percentage and its practical application to women's trades and businesses.

Mensuration: Measurement and calculation of areas of plane surfaces, as applied to women's trades.

Geography: The Public School Course for Form IV and the Junior Grade of Form V, with special reference to the commercial relations of Canada.

Note.—As far as possible the instruction should centre around collections of raw products, and pictures representing the processes of manufacture, especially those affecting women's trades—cotton, linen, silk, etc. Such collections are obtainable from various school supply companies. Probably some manufacturers will donate specimens of their products in their different stages.

History and Civics.—British and Canadian History, with emphasis on the industrial development of Great Britain and Canada. The forms of civic Government in Canada, Ontario, and Great Britain; the rights and duties of citizenship.

Materials: The materials and the characters of the various textiles; the methods of preparing and manufacturing them; judging kinds and qualities; uses, widths, and current prices; dyes and their use; materials for decoration.

Commercial Course.—*Book-keeping, Business Forms, and Penmanship*: Enough single entry to enable the student to keep records of petty cash or stock-room accounts in a shop; bills, cheques, notes, drafts, etc.; the formation of a legible, quick handwriting.

Note.—When the course is continued long enough, the student should be trained to carry out any cost system she may find in the shop where she may be employed.

Physical Culture and Physiology and Hygiene: A good system of physical exercise to develop the whole body; so much Physiology and Hygiene as will enable the workwoman to care for her health; first aid.

DRAWING.—*Freehand*: Familiar objects in outline; quick sketches to show designs; costume sketching.

Design: The principles of design and colour harmony, applied to curtains, tucks, ruffles, embroidery, candle shades, pillow-shams, etc.; making of drafts, patterns, and stencils; stencilling; combinations of colour and trimmings for dresses and headwear. Relation of house to surroundings; planning of house, colour schemes, interior decoration.

WORKSHOP PRACTICE.—*Sewing*: Hand and machine; dressmaking and millinery.

Housework: The furnishing and ordering of the kitchen and dining-room; care of the rooms of a house; cooking; composition of foods and their nutritive values; planning and serving meals; laundry work; sanitation and hygiene.

Novelties: Sample mounting, sample book covers, tissue paper novelties and decorations, etc.

NOTE.—Here as well as in the case of the Manual Training more time is needed than for the cultural and practical Household Science of the Public Schools; and, on account of the limitations of the rest of the course, more time can be apportioned to the Workshop Practice of the girls than to that of the boys.

NOTE.—Visits should be made to the local "openings." These visits should be made the subject of class discussions and compositions.